



Rail State of Good Repair

Recent Needs Estimates

Kristine Lee Leiphart, FTA Deputy CFO

July 2009

Overview

- Status of the nation's rail transit infrastructure:
  - Review funding history of over last three authorization periods
  - Estimate cost to bring infrastructure to a "state of good repair"
  - Identify best practices in transit asset management

Analysis Scope

- Assess the funding histories and state of good repair needs of nine rail operators (14 rail modes) listed below
- Investigation excludes:
  - Capacity improvements, major betterments, safety /security
  - Non-rail assets (e.g., bus, paratransit, ferry)

Agencies/Modes Considered

Agency	Modes
Chicago, CTA	Heavy Rail
Boston, MBTA	Heavy Rail, Light Rail and Commuter Rail
Metro-North Railroad	Commuter Rail
Long Island Rail Road	Commuter Rail
New York, NYCT	Heavy Rail
New Jersey, NJT	Commuter Rail, Light Rail
San Francisco, BART	Heavy Rail
Philadelphia, SEPTA	Commuter Rail, Light Rail and Heavy Rail
Washington, WMATA	Heavy Rail

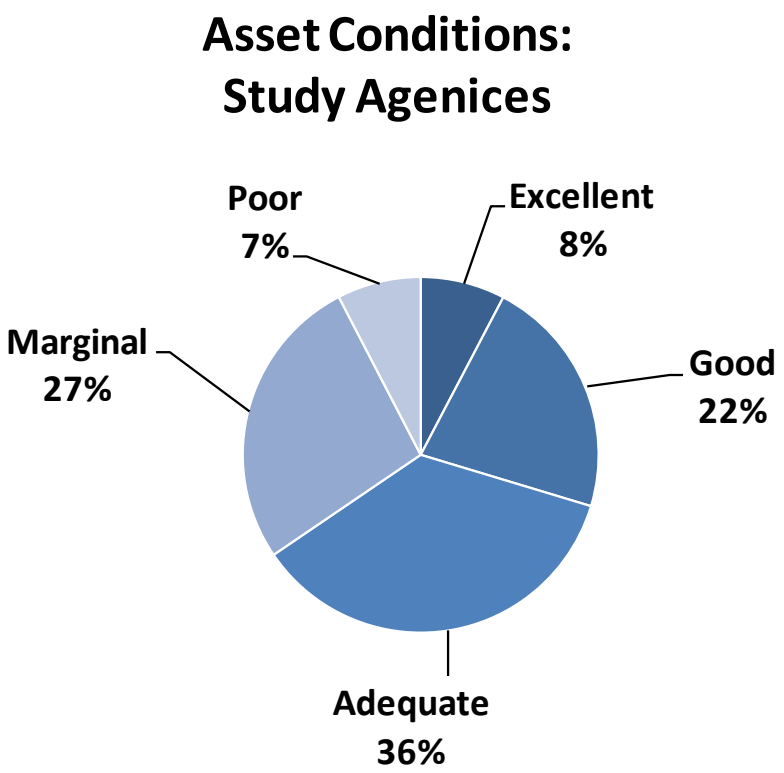
Agency Selection

– These nine agencies operate the majority of the nation's rail assets and serve the majority of it's rail riders

Study Agency	Rail Modes	Annual Passenger Boardings (Millions)	Track Miles	Passenger Stations	Fleet Vehicles
New York City Transit (NYCT)	Heavy Rail	1,804	835	468	6,202
Washington Metropolitan Area Transp. Authority (WMATA)	Heavy Rail	259	270	86	954
Massachusetts Bay Transportation Authority (MBTA)	Heavy Rail	142	108	53	408
	Light Rail	74	78	70	211
	Commuter Rail	38	649	126	488
Chicago Transit Authority (CTA)	Heavy Rail	187	288	144	1,190
Southeastern Pennsylvania Transportation Authority (SEPTA)	Heavy Rail	88	100	57	369
	Light Rail	25	219	46	141
	Commuter Rail	32	610	156	357
San Francisco Bay Area Rapid Transit District (BART)	Heavy Rail	99	267	43	660
MTA Long Island Rail Road (MTA LIRR)	Commuter Rail	96	701	124	1,161
New Jersey Transit Corporation (NJ TRANSIT)	Light Rail	14	103	52	93
	Commuter Rail	73	1,016	167	1291
Metro-North Railroad (MTA-MNCR)	Commuter Rail	74	805	109	1,104
Study Agency Total	**All**	**3,004**	**6,049**	**1,701**	**14,629**
Industry Total (commuter, heavy and light rail)	**All**	**3,775**	**11,796**	**2,975**	**19,655**
Study Agency Share of Industry Total	**All**	**80%**	**51%**	**57%**	**74%**

Current Conditions

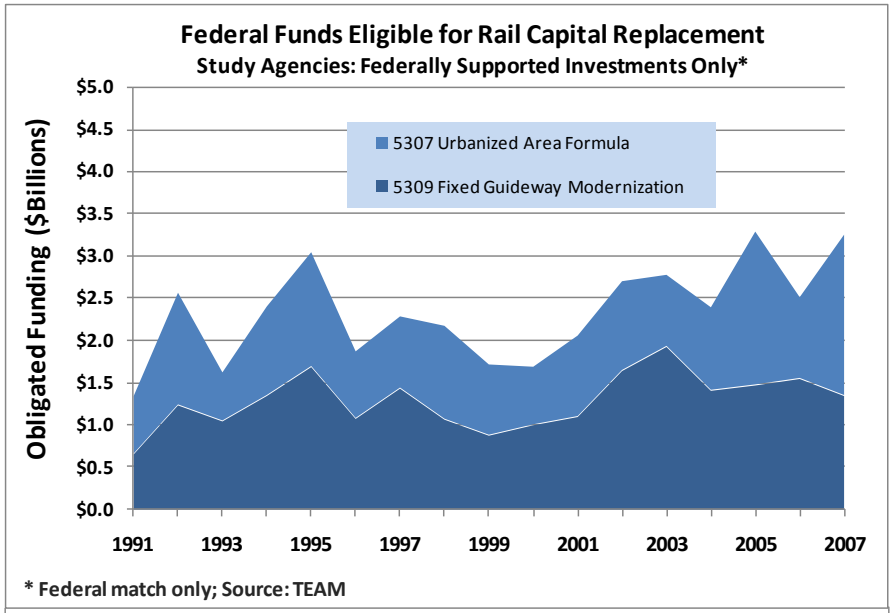
- The nine agencies also operate and maintain many of the nation's oldest transit assets
- More than one-third (34%) of the nine agency's assets are in either marginal or poor condition
- In comparison, less than 20% of all US transit assets are in marginal or poor condition
- This suggests agency reinvestment needs (per dollar invested) are higher than the rest of the industry

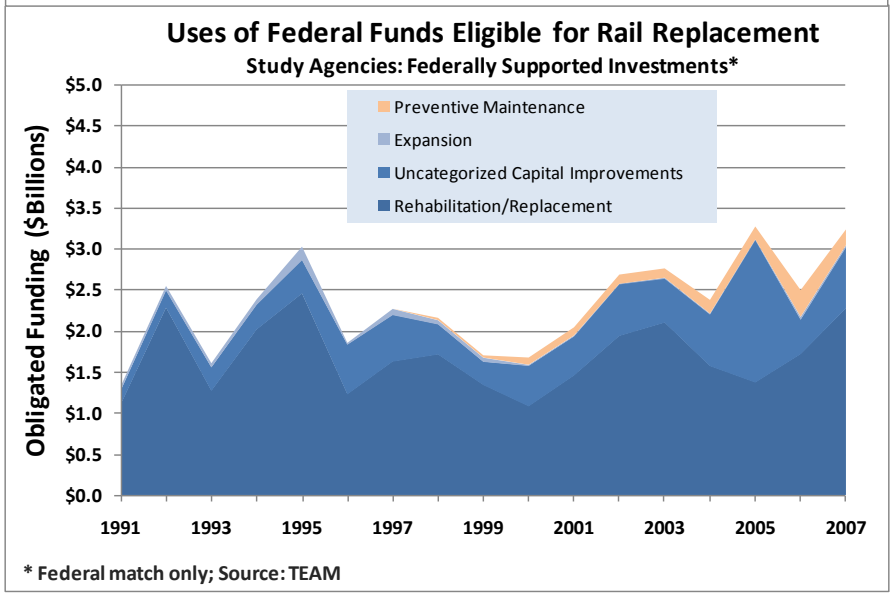


Source: TERM 2008

Past Trends in Federal Funding Support (Cont)

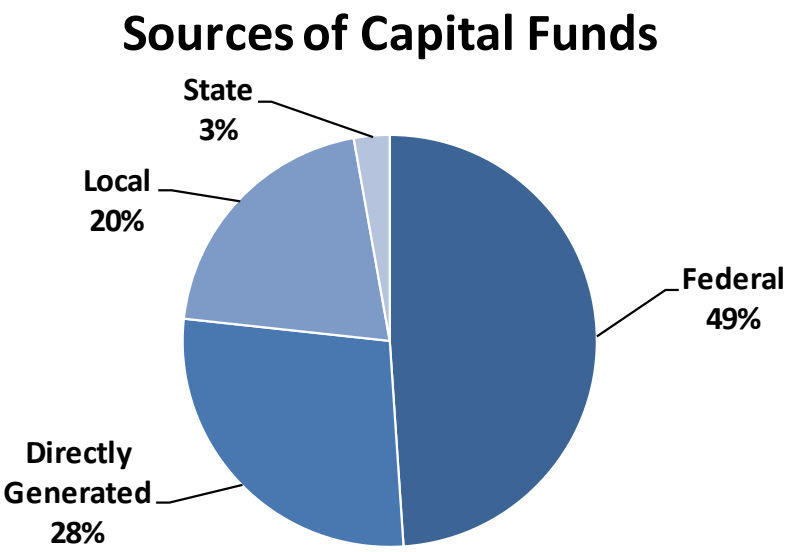
- Most Federal funds eligible for capital reinvestment originate from:
  - Section 5309 Fixed Guideway Mod
  - Section 5307 Urbanized Area
- Most funding is clearly applied to rehab/replacement activities
- A significant proportion of funding expenditures remain "uncategorized"





Sources of Funds

- In 2006, the nine agencies received $5.9B in capital funds from all levels of government and for all uses (including expansion)
- Federal sources accounted for just under half of this amount
- More than one quarter originated from directly generated funding sources
- State sources only cover about 3 percent of total capital expenditures.



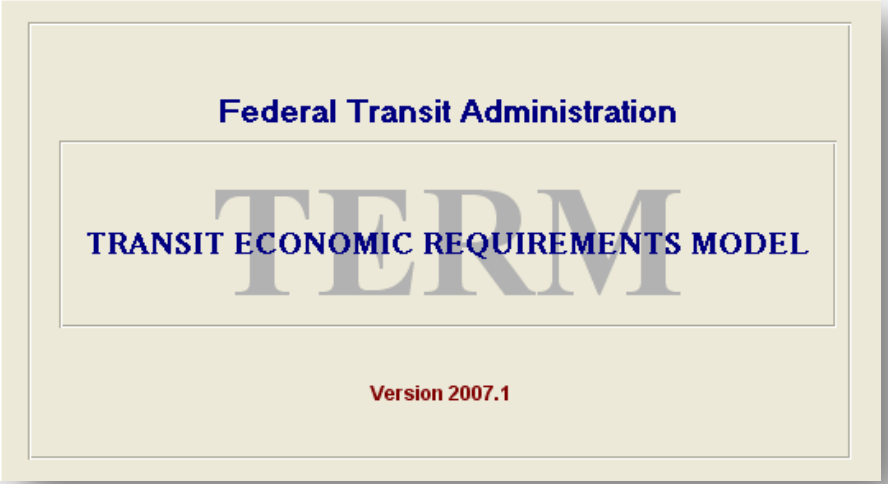
Source: NTD

Needs Estimation Approach

- Use FTA's Transit Economic Requirements Model (TERM) to estimate level of investment required to bring the nine agencies to a state of good repair
  - Only includes rehabilitation and replacement investments
  - Analysis relied on agency provided asset inventories
  - Applied consistent definition of "state of good repair" to all agencies
  - FTA team met with staff from study agencies to review analysis results

SGR Needs Estimates do *Not* Include:

- **System improvement, expansion or capacity improvements**
- **Investment needs of other US transit operators**
- **Do include non-rail capital needs of the nine study agencies**



Definition of State of Good Repair (SGR)

- "SGR" defined using TERM's numerically based conditions rating system
- An asset, group of assets or entire agency is in a state of good repair when the physical condition of that asset (or all assets owned by an agency) is at or above a condition rating of 2.50
- The level of investment required to attain and maintain a state of good repair is therefore that amount required to rehabilitate and replace all assets with an estimated condition of 2.50 or less

TERM's Condition Rating System

Condition	Ratings	Description
Excellent	**5.0 to 4.8**	New asset; No visible defects
Good	**4.0 to 4.7**	Asset showing minimal signs of wear; Some (slightly) defective or deteriorated component(s)
Adequate	**3.0 to 3.9**	Asset has reached its mid-life (condition 3.5); Some moderately defective or deteriorated component(s)
Marginal	**2.0 to 2.9**	Asset reaching or just past the end of its useful life (reached between condition 2.75 and 2.5); Increasing number of defective or deteriorated component(s) and increasing maintenance needs
Poor	**1.0 to 1.9**	Asset is past its useful life and is in need of immediate repair or replacement; May have critically damaged component(s)

Needs Estimates

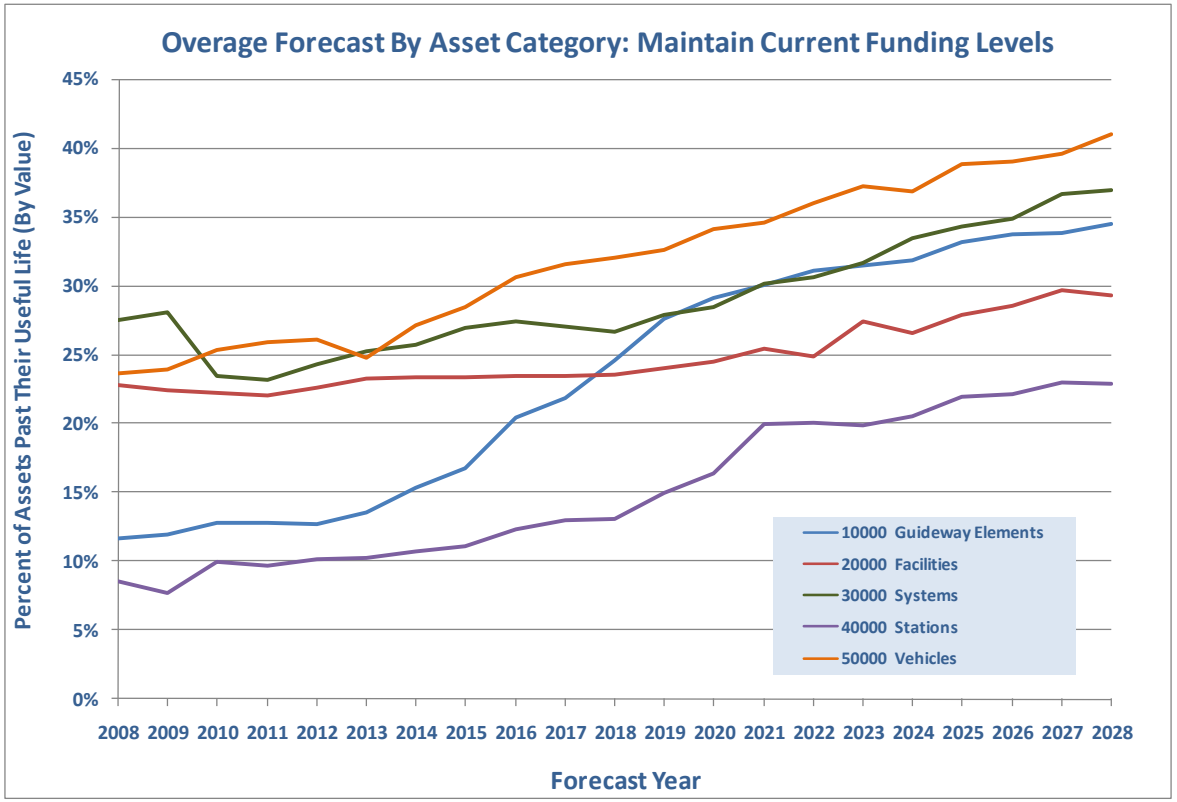
- The current SGR backlog for the nine agencies is roughly $50.0 billion ($2008)
- Once this backlog has been addressed, an additional annual investment of $5.9 billion would be required to maintain SGR
- Alternatively, a total annual investment of $8.4 billion would attain SGR over a twenty-year period while simultaneously addressing normal replacement needs (or $2.5 billion to address the backlog alone)

Study Agency SGR and Annual Normal Replacement Needs (Billions of $2008)

Mode	SGR Backlog	Average Annual Normal Replacement Needs	Annual Investment to Attain SGR over (including normal replacement):			Annual Investment to Eliminate SGR Backlog over:		
			6 Years	12 Years	20 Years	6 Years	12 Years	20 Years
Rail	$46.8	$5.0	$12.9	$9.0	$7.4	$7.8	$3.9	$2.3
Non-Rail	$3.2	$0.9	$1.4	$1.1	$1.0	$0.5	$0.3	$0.2
Total	**$50.0**	**$5.9**	**$14.3**	**$10.1**	**$8.4**	**$8.3**	**$4.2**	**$2.5**

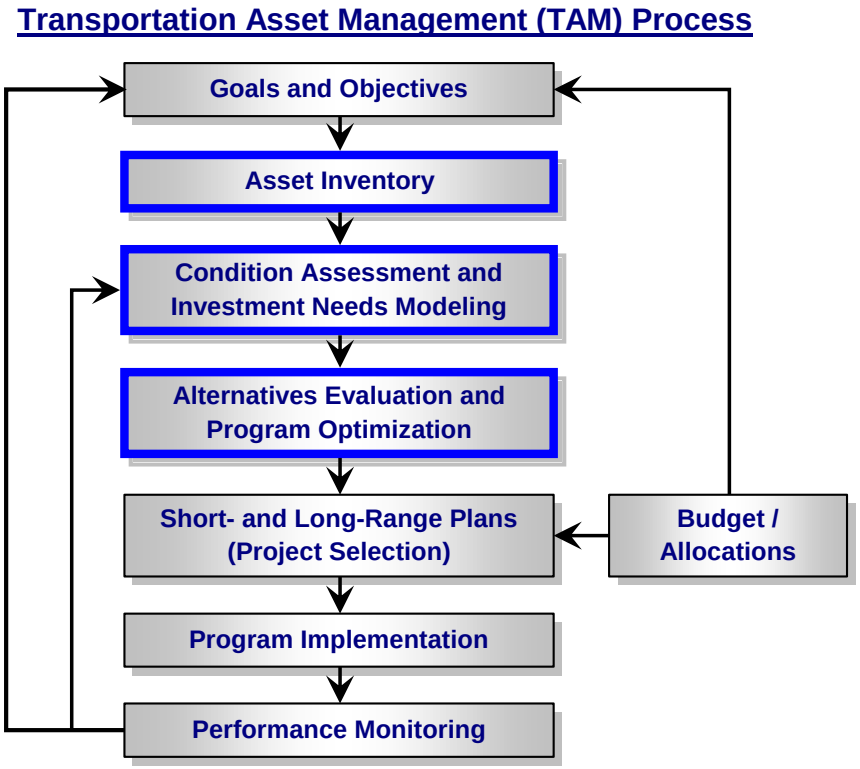
Needs vs. Current Expenditures

- The current annual $5.4 B reinvestment rate is:
  - Less than the $5.9 B required for normal replacement
  - Well below the $8.4 B required to address both normal replacement backlog needs
- Hence, in the absence of additional funding, the physical condition of these nine agencies is expected worsen



Document Asset Management Practices

- Document asset management practices employed by the nine agencies
- Assessment focused on the following asset management components:
  - Asset inventories
  - Asset condition monitoring (scheduled or periodic?)
  - Approaches to investment prioritization
  - Use of decision support tools



TAM process as promoted by AASHTO and FHWA

Document Asset Management Practices (cont)

Asset Inventory Development (capital planning)

- Seven of the nine agencies maintain asset inventories for capital planning purposes
- These inventories differ significantly in content and level of detail

Asset Condition Monitoring

- Only three of the nine agencies conduct condition assessments on a regular basis
- A fourth agency does so periodically
- Transit lags other sectors in this respect

Decision Support Tools/Processes

- Only one of the nine agencies currently maintains a decision support tool

Investment Prioritization

- Only two of the nine agencies use objective, multi-factor project scoring processes

Questions?

Contact Information:

Kristine Lee Leiphart, PhD
Deputy CFO
Office of Budget & Policy
Federal Transit Administration
Washington, DC 20590
direct: 202-366-7014
Kristine.Leiphart@dot.gov